

The new features of the DACS

RADIATION DOSE MONITOR (RDM)

AUTOMATIC DOSE REPORT

- Automatic and customized report sent directly to the person concerned
- Two different reports (in compliance with the 2013/59/Euratom directive):



a. Statistical Report modalities and/or procedures

- Percent of conformity per Dosimetry Type
- Dose range per Dosimetry Type
- Alerts Distribution
- Dosimetry Evolution per Dosimetry type
- Dose comparison per patient BMI

b. Patient Report

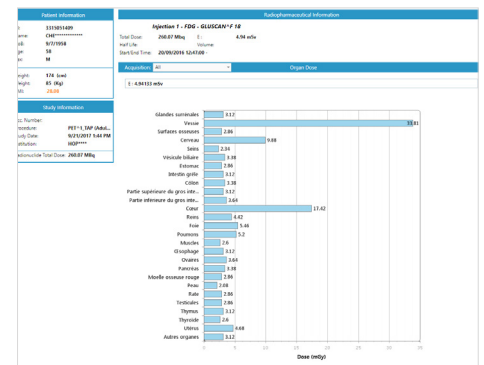
- Patients general demographics
- Alerts – patient level
- Alerts – study level
- Statistics – patient care (justification, reassignment, etc.)



ORGAN DOSE

NUCLEAR MEDECINE

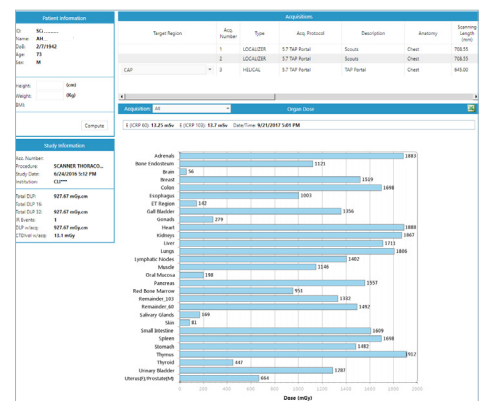
- Calculation of the effective dose based on the ICRP-106 and ICRP-128, including management of pediatrics
- Calculation based on the radiopharmaceutical
- Multiple injection support (e.g., Exercise testing: at rest and after effort)



SCANNER

Partnership with Virtual Phantoms for the integration of the organ dose module into the DACS RDM solution

- Monte Carlo algorithm calculation of mean doses delivered to organs by type of activity using existing dose data [DLP, CTDI, etc.]
- Estimation of the dose received by the fetus from the different stages of gestation of the pregnant woman
- Several parameters are considered: weight, height, age, pregnancy stages of the pregnant woman, etc.
- Calculation in accordance with ICRP-103 recommendations



EFFECTIVE DOSE

NUCLEAR MEDICINE

- Calculation of the effective dose based on the ICRP-106 and ICRP-128, including management of pediatrics
- Calculation based on the radiopharmaceutical
- Multiple injection support (e.g., Exercise testing: at rest and after effort)

SCANNER

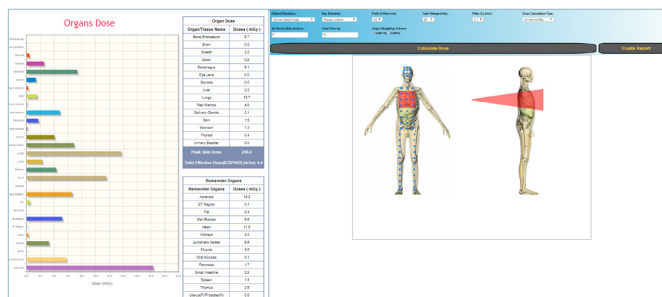
- Calculation by acquisition of the effective dose
- Calculation based on the ICRP-103 and ICRP-60

PIVOT TABLE

- Creation of dynamic pivot tables, based on the different categories of the RDM solution, which can be created in a few clicks:
 - Age
 - Procedures
 - Acquisition Protocols
 - Acquisition Types
 - Anatomical Regions
 - Institutions
 - Stations
 - Etc.
- Ability to have synthetic tables, which facilitate the interpretation and relevance of the dose data
- Ability to analyze and perform quick statistics
- Export dose data in 1 click in Excel format

SIMULATION TOOLS

- Organ dose and effective dose in scanner
- Organ dose, effective dose and Peak Skin Dose in interventional imaging



| Procedure | Acquisition Type | Scanning length (min) - Av | CLP (mSv) - Av | CTDIvol (mSv) - Av | SSDE (mSv) - Av | KVP (kV) - Av | Flash Factor (ratio) - Av |
|-------------------------------------|------------------|----------------------------|----------------|--------------------|-----------------|---------------|---------------------------|
| ABDOMINAL INU | 5011 CATH-MD 600 | AGAL | 56.25 | 59.63 | 38.66 | 120.00 | 1.00 |
| | 5012 CIRS | LOCALIZER | 12.50 | 86.03 | 31.70 | 25.61 | 1.00 |
| | 5013 CIRS | LOCALIZER | 21.95 | 25.37 | 38.21 | 120.00 | 0.53 |
| | 5014 No vna | AGAL | 20.00 | 48.46 | 24.23 | 18.87 | 1.00 |
| ABDOMINAL INU (MAR R4 RS) | 51128 Pylorus | HEBICAL | 609.58 | 628.87 | 9.89 | 110.00 | 1.08 |
| | 51129 Pylorus | LOCALIZER | 579.55 | 579.55 | 11.02 | 120.00 | 1.00 |
| | 51130 Pylorus | HEBICAL | 422.44 | 475.96 | 9.85 | 111.12 | 1.08 |
| | 51131 Pylorus | LOCALIZER | 612.72 | 612.72 | 11.02 | 120.00 | 1.00 |
| ABDOMINAL INU (MAR R4 RS) - CHANGER | 61132 Pylorus | HEBICAL | 388.68 | 481.66 | 11.42 | 112.42 | 1.42 |
| | 61133 Pylorus | LOCALIZER | 608.55 | 608.55 | 11.02 | 120.00 | 1.00 |
| | 61134 Pylorus | HEBICAL | 1411.88 | 975.64 | 6.75 | 100.00 | 0.52 |
| | 61135 Pylorus | LOCALIZER | 1398.55 | 1398.55 | 11.02 | 120.00 | 1.00 |
| ABDOMINAL INU (MAR R4 RS) - CHANGER | 91136 Pylorus | HEBICAL | 1330.00 | 493.79 | 1.56 | 5.87 | 1.00 |
| | 91137 Pylorus | LOCALIZER | 1398.55 | 1398.55 | 11.02 | 120.00 | 1.00 |
| | 91138 Pylorus | HEBICAL | 1104.00 | 1104.00 | 22.06 | 90.00 | 0.93 |
| | 91139 Pylorus | LOCALIZER | 173.88 | 490.50 | 25.73 | 120.00 | 1.00 |
| CARTOBIEN INU (MAR R4 RS) | 11130 Pylorus | HEBICAL | 268.55 | 268.55 | 11.02 | 120.00 | 1.00 |
| | 11131 Pylorus | LOCALIZER | 268.55 | 268.55 | 11.02 | 120.00 | 1.00 |
| | 11132 Pylorus | HEBICAL | 161.94 | 481.14 | 28.12 | 120.00 | 0.53 |
| | 11133 Pylorus | LOCALIZER | 268.55 | 268.55 | 11.02 | 120.00 | 1.00 |
| CARTOBIEN INU (MAR R4 RS) - CHANGER | 12134 Pylorus | HEBICAL | 268.55 | 408.45 | 16.82 | 10.00 | 1.08 |
| | 12135 Pylorus | LOCALIZER | 468.55 | 468.55 | 11.02 | 120.00 | 1.00 |
| | 12136 Pylorus | HEBICAL | 11.80 | 11.80 | 28.84 | 120.00 | 0.98 |
| | 12137 Pylorus | LOCALIZER | 390.31 | 390.31 | 9.34 | 147.1 | 1.00 |
| CARTOBIEN INU (MAR R4 RS) - CHANGER | 13138 Pylorus | HEBICAL | 4.56 | 4.56 | 11.66 | 120.00 | 1.00 |
| | 13139 Pylorus | LOCALIZER | 4.56 | 4.56 | 11.66 | 120.00 | 1.00 |

LATEST NEWS AT ECR 2018

- Peak Skin Dose (PSD) study: publication of the first results
- Four hospitals of the AP-HP group are currently conducting a study to validate the new feature of skin dose mapping. The RDM solution will hence be compared with experimental measurements using Gafchromic® films – first performed on anthropomorphic phantom, and then on patients in routine clinical conditions. The following experts have validated this study:
 - Jad FARAH, medical physicist, University Hospital of Le Kremlin-Bicêtre
 - Bouchra HABIB-GERYES, medical physicist, University Hospital of Necker Enfants-Malades
 - Lama HADID-BEURRIER, medical physicist, Hospital of Lariboisière
 - Marie-Joséphine WARYN, medical physicist, Hospital Jean-Verdier

First results of the Peak Skin Dose (PSD) study

On average, there is less than 10% difference between RDM's solution and the measurements using Gafchromic® films. These results will be presented by Lama Hadid-Beurrier, medical physicist, Lariboisière Hospital during ECR 2018.

CALCULATION OF THE PEAK SKIN DOSE (PSD)

